Technical Data Sheet

Formerly Known As: **PANOLIN BIOFLUID ZFH**

Shell **PANOLIN** ***Biofluid ZFH***

- Versatile Application
- ZF Approved
- Biodegradability Profile: See Specifications and Approvals

Advanced Synthetic Ester Universal Tractor Transmission Oil

Shell PANOLIN is our range of high-performance lubricants and greases tested for high biodegradability and lower environmental impact in aquatic environments. Shell PANOLIN Biofluid ZFH is formulated with synthetic esters to deliver good thermal and oxidative ageing stability in transmission and hydraulic system applications. Biodegradability profile: ≥82% w/w of this lubricant's components are readily biodegradable, achieving a passing result of ≥60% according to OECD 301B. The fully formulated lubricant meets the requirements of EN 17181:2019.

DESIGNED TO MEET CHALLENGES

Performance, Features & Benefits

- **Design to protect against cold**

  Excellent cold flow characteristics due to extremely low pour point.

- **Maintaining System Efficiency**

  Good thermal-ageing stability protects the machine over time.

- **Lower Environmental Impact**

  Offers reduced impact of leaks or accidental spillage into aquatic environments compared to conventional mineral oils thanks to their higher biodegradability. (Publication EPA 800-R-11-002).

Biodegradability profile:

At least 82% by mass of this lubricant's components are readily biodegradable, achieving a passing result of ≥60% according to OECD 301B.

Meets the requirements of EN 17181:2019, a modified OECD 301B-based test method for determining the aerobic biodegradation of fully formulated lubricants.

Low ecotoxicity:

Classified as 'not harmful' to algae, freshwater invertebrates and fish when tested to Industry Standard by 3rd Party Lab as water-accommodated fractions (WAFs) according to OECD test guidelines 201, 202 and 203 meeting the requirements of EN 16807 > 100mg/L for acute toxicity tests.

Main Applications



- **WARNING!**

  Not to be used as an Engine Oil.

Specifications, Approvals & Recommendations

- ZF TE-ML 03H, 06G, 07E
- ≥82% w/w of this lubricant's components are readily biodegradable, achieving a passing result of ≥60% according to OECD 301B
- Meets requirements of EN 17181:2019

  For a full listing of equipment approvals and recommendations, please consult your local Shell Technical Helpdesk.

Compatibility & Miscibility

- It is strongly recommended that an oil sample is taken from the system following changeover and analysed via the Shell Rapid Lubricants Analysis service to confirm the new fluid charge is fit for use.
- **Fluid Compatibility**

  Shell PANOLIN Fluids are miscible with mineral oils. However, in order to ensure that the environmental properties and performance of Shell PANOLIN Fluids are maintained, the system should be drained and flushed thoroughly when changing fluids.

Typical Physical Characteristics

Properties			Method	Shell PANOLIN BIOFLUID ZFH
Kinematic Viscosity	@40°C	mm^2/s	ASTM D445	71.5
Pour Point		°C	ASTM D97	-55
Flash Point		°C	ASTM D92	244
Density	@15°C	kg/m^3	ASTM D4052	923

These characteristics are typical of production, variations in these characteristics may occur.

Health, Safety & Environment

- **Health and Safety**

  This product is unlikely to present any significant health or safety hazard when properly used in the recommended application and good standards of personal hygiene are maintained.

  Avoid contact with skin. Use impervious gloves with used oil. After skin contact, wash immediately with soap and water.

  Guidance on Health and Safety is available on the appropriate Safety Data Sheet, which can be obtained from http://www.epc.shell.com.

- **Protect the Environment**

  Take used oil to an authorised collection point. Do not discharge into drains, soil or water.

Additional Information

- **Advice**

  Advice on applications not covered here may be obtained from your Shell Representative.

- **Additional Technical Advice**

  The information and guidance offered for use of Shell PANOLIN products is based on experience and understanding gained through the development and manufacturing of lubricants. The performance of the products can be influenced by a number of variables, not limited to, contamination, operating temperature, equipment application, external environment and material type. It is recommended that you discuss application and fluid recommendations with both your OEM and local Shell technical representative before the product is used. Advice given is non binding and Shell will not be held liable for any consequence as a result of or through misuse of the fluid.